

**Joint APEC-IRENA Workshop on  
Renewable Energy Statistics  
(18<sup>th</sup> APEC Workshop on Energy Statistics)**

# **APEC Renewable Energy Roadmap**

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**Asia-Pacific  
Economic Cooperation**

**EGNRET**

**APEC Expert Group on  
New and Renewable Energy Technologies**

# Background of RE Doubling Goal



## 2014 Leaders' Declaration

We endorse the Energy Ministers' aspirational goal to double the share of renewables including in power generation by 2030 in APEC's energy mix.

## 2015 Leaders' Declaration

We therefore reaffirm our aspirational goals to reduce aggregate energy intensity by 45 percent by 2035 and double renewable energy in the regional energy mix by 2030 to achieve sustainable and resilient energy development within the Asia-Pacific.

## 2016 Leaders' Declaration

We reaffirm our aspirational goals to reduce aggregate energy intensity by 45 percent by 2035 and double renewable energy in the regional energy mix by 2030.

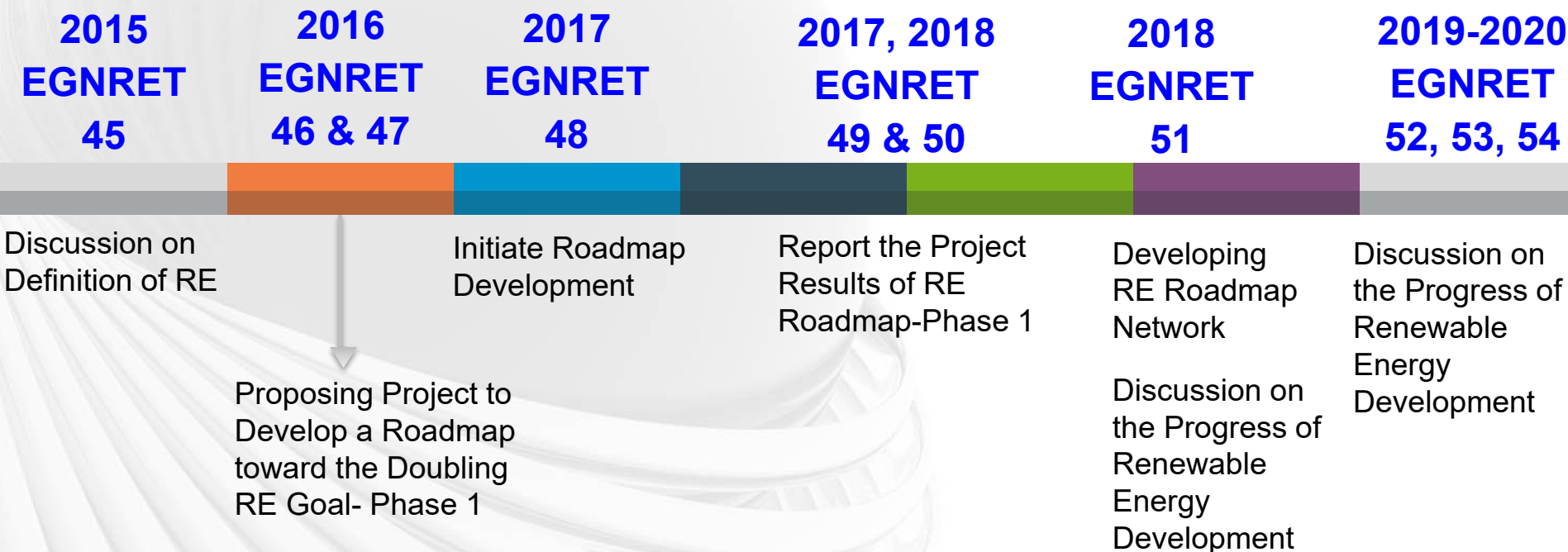


# Background of RE Doubling Goal



**EMM 11  
2014**

- Energy Ministers aspired to the goal of “doubling the share of renewables in the APEC energy mix, including in power generation, from 2010 levels by 2030.”
- Energy Ministers instructed the EWG through the EGNRET to develop the road map .

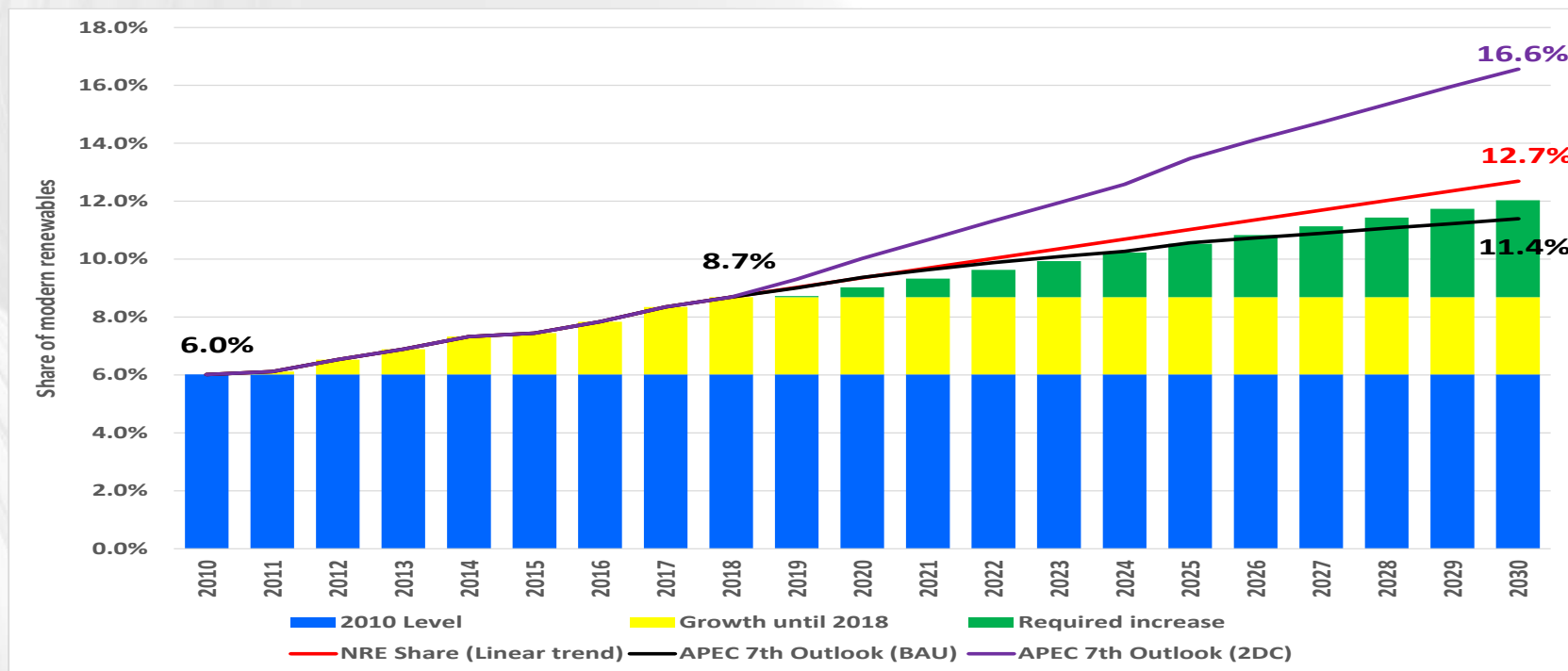


# Roadmap for APEC RE Development



## Gap for Achieving RE Goal

Renewable energy share in total final energy demand, 2010-2030



Source: EGEDA Update in EGNRET 54 Meeting, Nov. 2020



# EGNRET Projects related APEC RE Doubling Goal



EGNRET has variety of projects for renewable energy development including general plans, investment, financing and development of the specific technologies such as solar PV, biomass, wind and energy storage.

## Examples

### ◆ On-going EGNRET Projects related APEC RE Doubling goal

Filling the Gap to Reach the Goal of Doubling Renewable Energy in the APEC Region - Phase 2  
(EWG 02 2019A)

- Developing a strategic pathway with a work program of priority for policy recommendation towards the goal.
- The draft roadmap is expected to produce and share in the end of 2020.

Exploring Co-Benefit Opportunities for Renewable Energy and Energy Efficiency Projects in the APEC Region  
(EWG 04 2019A)

- Sharing best practices for the RE&EE project and selected successful project in transportation sector and build capacity in project design and planning.
- The final report is expected to be finished in July-September 2020.

# Roadmap for APEC RE Development



## Phase 2

### Renewable Energy Use

*The phase 2 will be published in the end of 2021*

Power

Non Power

## Phase 1

1

Electricity

2

Transport

3

Heating

Note: This two projects were proposed and conducted by Chinese Taipei and shared with EGNRET.

# Framework for APEC RE Roadmap -Phase 2



## Compared with Phase 2 vs Phase 1

### Roadmap

#### Regional RE Development

Current RE Development

RE Policies

#### Gap Assessment

RE Targets in APEC economies

Gap for Reaching Target

Additional Investment

#### Roadmap Development

Challenges

Milestones

Priority Selection

Policy Suggestions

Best Practice and case study

- Electricity
- Heating
- Transportation

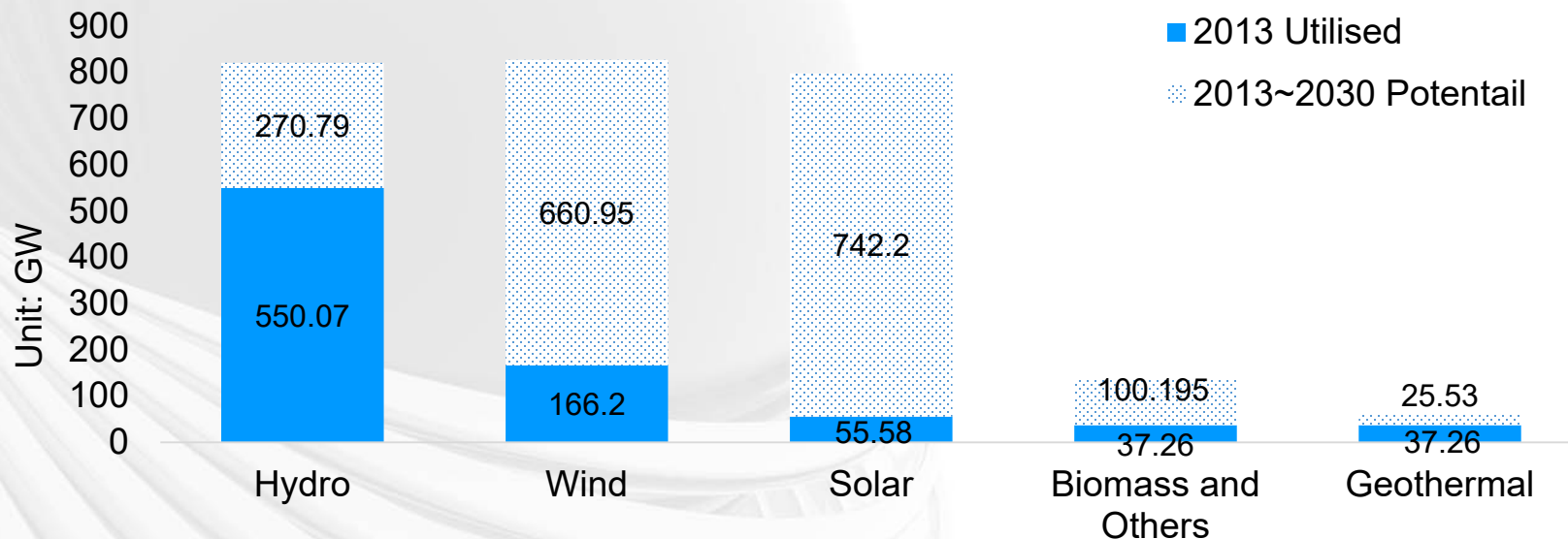
### Workshop

1 APEC Workshop

Sector	Strategy	By Technology
Power sector	Market Reform	<ul style="list-style-type: none"> <li>• Solar</li> <li>• Wind</li> <li>• Geothermal</li> <li>• Hydro</li> <li>• Ocean</li> <li>• Bioenergy</li> </ul>
	Financial Mechanism	
	Capacity Building	
	Technology Innovation	
Heating	Infrastructure	<ul style="list-style-type: none"> <li>• Solar</li> <li>• Bioenergy</li> <li>• Geothermal</li> </ul>
Transportation Sector	Policy Consistency	<ul style="list-style-type: none"> <li>• Biofuel</li> <li>• EV (V2G)</li> <li>• H2</li> </ul>

## Renewable Energy Potential

- ◆ In the APEC region, until 2013, **the total utilized renewable energy potential was 846.37 GW, and the renewable energy potential from 2013 to 2030 is estimated as 1,799.6 GW.**



Source: APERC, 2016



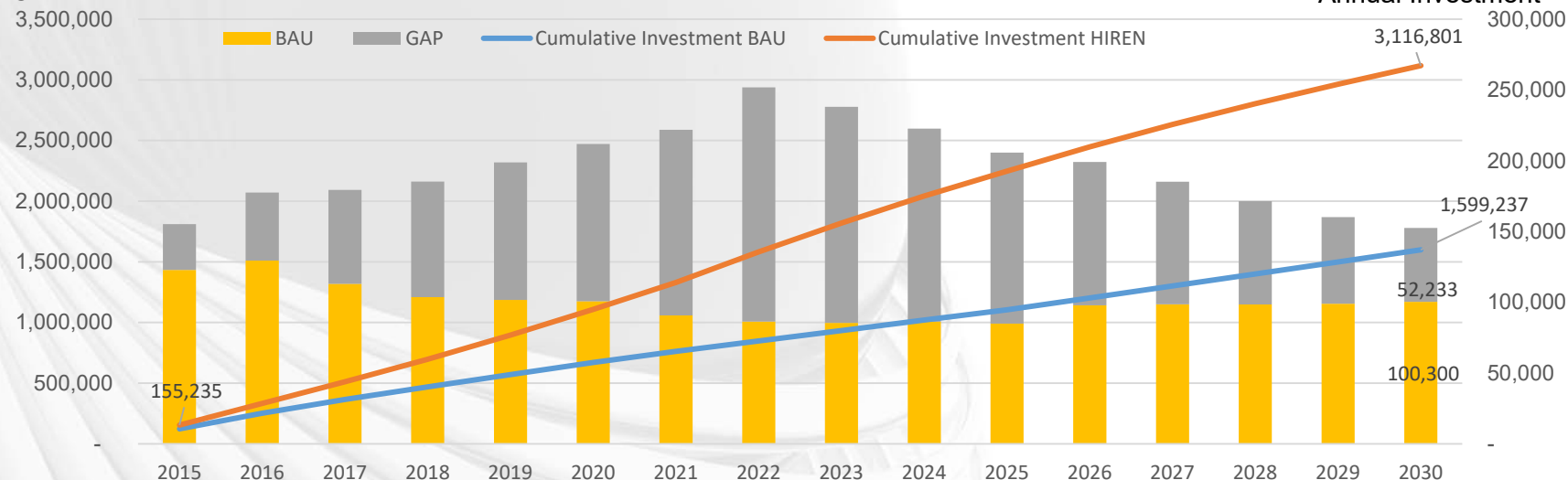
# Project Results for RE Electricity Roadmap

## Renewable Energy Investment

- ◆ APEC renewables investment was **USD 236,477 million** in 2015.
- ◆ APEC region still needs to increase around **92,679 million per year** to reach the doubling renewable energy goal.

Unit: USD Million (Additional Transmission and Distribution)

Cumulative Investment



Source: APERC, 2016

# Project Results for RE Electricity Roadmap



## Electricity –Policy Recommendations

Approach	Recommendation
Policy Consistency	<ul style="list-style-type: none"> <li>➤ Make a Strategy for Long-term Renewable Energy Development</li> <li>➤ Strengthen Renewable Energy Policy Commitment</li> <li>➤ Reduce Fossil Fuel Subsidy Gradually</li> <li>➤ Enhance the Subsidy for Renewable Energy</li> <li>➤ Impose the External Cost on Fossil Fuel</li> </ul>
Market Reform	<ul style="list-style-type: none"> <li>➤ Renewable Energy Certificates Market Building</li> <li>➤ Electricity Market Design</li> </ul>
Capacity Building	<ul style="list-style-type: none"> <li>➤ Professional Skill</li> <li>➤ Public Awareness</li> <li>➤ Gender Equality</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>➤ Introducing Micro-grid</li> <li>➤ Introducing Smart Grid</li> <li>➤ Formulating Legislations for Related Techniques</li> </ul>
Technology Innovation	<ul style="list-style-type: none"> <li>➤ Combination of RE development and efficiency improvement of RE technology</li> <li>➤ Providing R&amp;D funding for the innovation of RE technology</li> <li>➤ Electricity transition and distribution</li> <li>➤ Electric vehicle</li> <li>➤ Energy storage</li> </ul>
Financial Mechanism	<ul style="list-style-type: none"> <li>➤ Grants</li> <li>➤ Venture Capital Equity</li> <li>➤ Bond</li> <li>➤ Resource /Political Insurance</li> <li>➤ Tax Credit</li> </ul>

# Roadmap for APEC RE Development



## Transport – Policy Recommendations

Challenges		Suggestions
Policies and Regulations	<ul style="list-style-type: none"> <li>◆ Lack of clear land ownership</li> <li>◆ Fossil fuel subsidies</li> </ul>	<ul style="list-style-type: none"> <li>◆ Remove fossil fuel subsidies</li> <li>◆ Blending mandates</li> <li>◆ Monitoring mandate</li> <li>◆ Providing a long term policy framework</li> <li>◆ Creating domestic land-use database</li> </ul>
Financing	<ul style="list-style-type: none"> <li>◆ Limited financial resources to new technology development</li> </ul>	<ul style="list-style-type: none"> <li>◆ Grants and loan guarantees</li> <li>◆ Tax incentive</li> </ul>
Capacity Building	<ul style="list-style-type: none"> <li>◆ Lack of skilled labor (feedstock, refinery, blending, etc.)</li> <li>◆ Public awareness</li> </ul>	<ul style="list-style-type: none"> <li>◆ Cross APEC economy - collaboration on capacity building</li> <li>◆ Training Programs</li> <li>◆ Public discussion</li> </ul>
Market Building	<ul style="list-style-type: none"> <li>◆ Commercial scale</li> <li>◆ Feedstock cost fluctuation</li> <li>◆ Relative low oil price</li> </ul>	<ul style="list-style-type: none"> <li>◆ Certification</li> <li>◆ Remove trade barriers</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>◆ Poor rural areas are lack of infrastructure</li> <li>◆ Poor accessibility to rural areas</li> </ul>	<ul style="list-style-type: none"> <li>◆ Infrastructure policies on a domestic level</li> </ul>
Technology Innovation	<ul style="list-style-type: none"> <li>◆ 10%-15% ethanol in gasoline vehicle compatibility constraints</li> <li>◆ Advanced biofuel technologies are not yet commercialized</li> </ul>	<ul style="list-style-type: none"> <li>◆ International collaboration</li> <li>◆ Technology transfer</li> <li>◆ Ensuring sustained funding and support mechanism to innovate advanced biofuel technologies</li> </ul>

# Roadmap for APEC RE Development



## Heating- Policy Recommendations

Key Issue	Challenge	Suggestion
Financing	<ul style="list-style-type: none"> <li>◆ High up-front investment costs</li> <li>◆ High investment risk</li> </ul>	<ul style="list-style-type: none"> <li>◆ Capital grants and operating grants</li> <li>◆ Low interest or no interest loan/ long term loans/ loan guarantees</li> <li>◆ Tax incentives (tax credits, reduction, accelerated depreciation)</li> </ul>
Policies and Regulations	<ul style="list-style-type: none"> <li>◆ Lack of policies for renewable heating</li> <li>◆ Lack of standards for heating equipment</li> </ul>	<ul style="list-style-type: none"> <li>◆ Building regulation for specific renewable heating technologies (ex. Solar thermal system for hot water)</li> <li>◆ Standard for heating equipment (prevent less efficient technology design, create greater confidence in the reliability of the technology, reduce investment risk)</li> </ul>
Capacity Building	<ul style="list-style-type: none"> <li>◆ Lack of public awareness</li> <li>◆ Lack of skilled labors for installing</li> </ul>	<ul style="list-style-type: none"> <li>◆ Information campaigns (technical assistance, finance advice, labeling of appliances, information distribution)</li> <li>◆ Provide training to increase installer knowledge</li> </ul>
Market Building	<ul style="list-style-type: none"> <li>◆ Fossil fuel subsidies</li> <li>◆ Enhance the Economic competitiveness of RE technologies</li> </ul>	<ul style="list-style-type: none"> <li>◆ Balance the subsidies for fossil fuel and RE technologies</li> <li>◆ Co2 taxes and carbon trading system</li> </ul>



# Cooperation with EGEDA

## RE Doubling Roadmap

### EGNRET

Policy  
Recommendations  
for RE Doubling  
Goal

### APERC+EGEDA

- Data Collection
- Projection for RE Doubling Goal
- Target Tracking



## The Conclusions from the 54<sup>th</sup> Energy Working Group Meeting

- ◆ Traditional biomass will not be counted; IRENA's definition of renewable energy is recommended;
- ◆ APEC data should be used for modeling and monitoring the progress.



# Thank you for your attention!

EGNRET website: <http://www.egnret.ewg.apec.org/>



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APEC Energy Working Group

Expert Group on New and Renewable Energy Technologies (EGNRET)

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